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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/989,779 | MILLER LL ET AL. | |
| | Examiner | Art Unit | |
| | KHAWAR IQBAL | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13 and 15-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/17/2919 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 4-5, 8, 9-11, 13, 15-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2001/0024964 A1) in view of Kogiantis et al (20020068611) and Ohashi (EP 0740430 A2).

Regarding claim 1, Wang et al discloses a radio receiver comprising (fig. 2):

first (A1, fig. 2) and second (A2, fig. 2) antennas connected to radio frequency processing circuitry by an RF switch (SW, FIG. 2); and

an radio frequency switch control (CONTROL ELEMENT FL, FIG. 2) in communication with said radio frequency switch (SW, FIG. 2), the radio frequency switch control for switching between the first (A1, fig. 2) and second (A2, fig. 2) antennas in response to a schedule of a sequence of scheduled packet bursts, wherein said schedule is scheduled by a base station (BTS, fig. 2), wherein the sequence of scheduled packet bursts comprises a first signal burst received via the first antenna and a second signal burst received via said second antenna (When the power control string in the sliding window is of a certain type, a matching row is read from the table to implement the predefined action stored in the table to change the antenna, para. # 0022, 0025 and 0027). Wang et al fails to expressly disclose a predefined schedule and first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Kogiantis et al discloses that switching between the first and second antennas in response to a predefined schedule (paragraphs 0014, 0021, 0024). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Kogiantis to include the above predefined

schedule in order to specific instant of time, a specific antenna is selected for a specific subscriber and high information error rate is avoided. Wang et al and Kogiantis et al fails to expressly disclose first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Ohashi et al discloses that when a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re-transmitted (see page 10, line 57 - page 11, line 2), which reads on the claimed first signal burst and second signal burst comprise identical packets of a common message. When a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re- transmitted (see Ohashi et al page 10, line 57 - page 11, line 2) and simultaneously, the receiving error count is increased by 1 and the receiving antenna is switched (see Ohashi et al page 11, lines 39-47), so in this case the same data would be received by two different antennas as claimed. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Ohashi et al to include the above retransmission of the same data in order to prevent the loss of data.

Regarding claim 4, Wang discloses wherein: the antennas are switched so that each antenna receives a related packet burst (para. # 0025 and 0027 and also see Ohashi et al).

Regarding claims 5, 8, Wang et al discloses a method of achieving a Quality of Service (QoS) control in a wireless local area network (LAN) communication system, comprising steps of:

transmitting a message contained within a plurality of packet bursts occurring at spaced time intervals, wherein a first packet burst and a second packet burst of said plurality of packet bursts; and receiving each of the packet bursts individually at one of a plurality of antennas in accordance with a schedule, where said schedule is scheduled by a base station and is used to select one of said plurality of antennas for receiving each of said packet bursts (para. # 0022, 0025, 0027). Wang et al fails to expressly disclose a predefined schedule and first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Kogiantis et al discloses that switching between the first and second antennas in response to a predefined schedule (paragraphs 0014, 0021, 0024). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Kogiantis to include the above predefined schedule in order to specific instant of time, a specific antenna is selected for a specific subscriber and high information error rate is avoided. Wang et al and Kogiantis et al fails to expressly disclose first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Ohashi et al discloses that when a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-

transmission of the same data, and the same data is re-transmitted (see page 10, line 57 - page 11, line 2), which reads on the claimed first signal burst and second signal burst comprise identical packets of a common message. When a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re- transmitted (see Ohashi et al page 10, line 57 - page 11, line 2) and simultaneously, the receiving error count is increased by 1 and the receiving antenna is switched (see Ohashi et al page 11, lines 39-47), so in this case the same data would be received by two different antennas as claimed. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Ohashi et al to include the above retransmission of the same data in order to prevent the loss of data.

Regarding claim 9, Wang discloses each of the plurality of the antennas is connected to a radio receiver at separate times relative to other antennas (para. # 0022, 0025, 0027).

Regarding claim 10, Wang discloses including a complete message within each packet burst (para. # 0025, 0027).

Regarding claim 11, wang discloses a message is spread across the plurality of packet bursts by space-time coding (para. # 0023, 0025, 0027).

Regarding claim 13, Wang discloses a communication system for coupling a transmitter and a receiver adapted for receiving at least first and second signal bursts

by first and second antennas respectively, and responding to the two signal bursts to communicate a single unified message at the receiver; whereby:

the first and second signal bursts are sequentially separated in time in accordance with a predefined schedule, wherein said predefined schedule is scheduled by a base station, the first and second antennas are sequentially enabled in accordance with said predefined schedule to communicate with at least one storage medium at the receiver; and enabling a representation of the unified message by responding to the first and second signal bursts (para. # 0022, 0025, 0027, fig. 2).

Wang et al fails to expressly disclose a predefined schedule and first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Kogiantis et al discloses that switching between the first and second antennas in response to a predefined schedule (paragraphs 0014, 0021, 0024). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Kogiantis to include the above predefined schedule in order to specific instant of time, a specific antenna is selected for a specific subscriber and high information error rate is avoided. Wang et al and Kogiantis et al fails to expressly disclose first signal burst and second signal burst comprise identical packets of a common message.

In a similar field of endeavor, Ohashi et al discloses that when a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re-transmitted (see page 10, line

57 - page 11, line 2), which reads on the claimed first signal burst and second signal burst comprise identical packets of a common message. When a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re- transmitted (see Ohashi et al page 10, line 57 - page 11, line 2) and simultaneously, the receiving error count is increased by 1 and the receiving antenna is switched (see Ohashi et al page 11, lines 39-47), so in this case the same data would be received by two different antennas as claimed. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Ohashi et al to include the above retransmission of the same data in order to prevent the loss of data.

Regarding claim 15, Wang discloses a common message is derived from the sequential signal bursts received by the first and second antennas (para. # 0025 and 0027 and also see Ohashi et al).

Regarding claim 16, Wang discloses that said enabling includes retaining the first and second signal bursts in said at least one storage medium and processing to deliver: the single unified message (para. # 0025 and 0027 and also see Ohashi et al).

Regarding claim 17, Wang disclose selecting a message from one of the antennas (para. # 0025 and 0027 and also see Ohashi et al). Ohashi et al discloses a system where, when an error is detected, the antenna is switched and the information is re-transmitted (see page 10, line 57 - page 11, line 2), which reads on the claimed "selecting a message from one of the antennas".

Regarding claim 18, Wang discloses that said deriving the common message includes selecting a message from one of the receiving antennas (para. # 0025 and 0027 and also see Ohashi et al).

Regarding claim 21, Wang disclose sending a message to the transmitting end to cease further bursts (para. # 0025 and 0027 and also see Ohashi et al discloses a system where, when an error occurs, a response indicating the error is sent to the transmitting end, requesting re-transmission of the same data (see page 10, line 57 - page 11, line 2).

4. Claims 2, 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Kogiantis et al (20020068611), Ohashi and Aaronson et al (US006363062B1).

Regarding claim 2, Wang, Kogiantis and Ohashi fails to expressly disclose the use of a MAC protocol. In a similar field of endeavor, Aaronson et al discloses a radio system where the MAC layer schedules communication bursts (see column 4, lines 22-63) taking into account factors such as propagation delay between the different nodes, queuing of data and synchronization of the time transmitting from multiple nodes (see column 3, lines 22-30).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang, Kogiantis, Ohashi with Aaronson et al to include the above MAC layer in order to use the advantages of a MAC protocol such as more efficient use of the spectrum at a given region as suggested by Aaronson et al (see column 3, line 66 - column 4, line 2).

Regarding claim 3, Wang, Kogiantis and Ohashi fails to disclose that the RF switch control is a MAC processor.

In a similar field of endeavor, Aaronson et al discloses that the MAC algorithm should synchronize the time of transmitting from multiple nodes (see column 3, lines 22-29).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang, Kogiantis et al and Ohashi with Aaronson et al to include the above MAC layer in order to use the advantages of a MAC protocol such as more efficient use of the spectrum at a given region as suggested by Aaronson et al (see column 3, line 66 - column 4, line 2).

Regarding claim 12, Wang, Kogiantis fails to expressly disclose the use of a protocol.

Aaronson et al discloses a radio system where the MAC layer schedules communication bursts (see column 4, lines 22-63) taking into account factors such as propagation delay between the different nodes, queuing of data and synchronization of the time transmitting from multiple nodes (see column 3, lines 22-30).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wang with Aaronson et al to include the above MAC layer in order to use the advantages of a MAC protocol such as more efficient use of the spectrum at a given region as suggested by Aaronson et al (see column 3, line 66 - column 4, line 2).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2001/0024964 A1) in view of Kogiantis et al (20020068611), Ohashi (EP 0740430 A2) and Khayrallah (XP-000889044).

Regarding claim 6, the combination of Ohashi et al and Khayrallah discloses that when a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re-transmitted (see Ohashi et al page 10, line 57 - page 11, line 2) and simultaneously, the receiving error count is increased by 1 and the receiving antenna is switched (see Ohashi et al page 11, lines 39-47), so in this case the same data would be received by two different antennas as claimed.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2001/0024964 A1) in view of Kogiantis et al (20020068611), Ohashi (EP 0740430 A2) and Suzuki (US 5787122).

Regarding claim 7, the combination of Wang, Ohashi et al fails to expressly disclose a message spread across packet bursts.

In a similar field of endeavor, Suzuki discloses a system that receives an encoded signal dispersed into a plurality of symbols interleaved over a plurality of burst data (see column 8, line 62 - column 9, line 12), which reads on the claimed "each packet burst contains a portion of a space-time coded message spread across the first and second packet bursts".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Ohashi et al, Wang with Suzuki to include the above signal dispersed into a plurality of symbols in order to use the advantages of burst signals such as the fact that transmission data are dispersed and thus can be transmitted from a plurality of antennas which improves the SIN of the reception signal as suggested by Suzuki (see column 8, lines 12-18 and figure 5).

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohashi et al (5799245) in view of Khayrallah (XP-000889044).

Regarding claim 5, Ohashi discloses a diversity radio communication system where an antenna switch circuit 10 switches the first and second antennas 11 and 12 to connect them to the transmit/receive switch circuit 9 (see page 6, lines 1-8), which reads on the claimed invention that receives communications from a transceiver at a transmission station by wireless transceivers at receiving stations having switched protocol diversity reception operational modes, and uses this configuration to receive data from first and second antennas. The received data is stored in the temporary memory 2 of the memory 3 (see page 6, lines 38-40), which reads on the claimed "recording the received bursts as soft information in a storage medium", a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re-transmitted (see page 10, line 57 - page 11, line 2), which reads on the claimed first and second signal bursts are identical packets of a common message, wherein said predefined schedule is

scheduled by a base station (page 2, lines 20-32). Ohashi et al fails to expressly disclose the combining of information.

In a similar field of endeavor, Khayrallah discloses an improvement of time-diversity methods where a receiver cycles through groups of antennas and the antennas within a group are combined by the receiver chains (see paragraph 3), which reads on the claimed "combining the soft information from the first and second bursts into a single message". Furthermore, Khayrallah discloses that antenna switching is preferably bur not necessarily done before a new slot is to be received, which reads on the claimed "enabling a first antenna to receive a first packet burst in accordance with said predefined schedule; enabling a second antenna to receive a second packet burst in accordance with said predefined schedule," wherein the system may be a TDMA system (see paragraph 5) so all transmissions and receptions are according to a predefined schedule.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Ohashi et al with Khayrallah to include the above combining of data in a TDMA system in order to improve the time-diversity methods as suggested by Khayrallah (see the title).

Regarding claim 6, the combination of Ohashi et al and Khayrallah discloses that when a detected error is uncorrectable, the terminal unit on the receiver side recognizes it as a receiving error and sends a response indicating the error to the transmitter side, requesting re-transmission of the same data, and the same data is re-transmitted (see Ohashi et al page 10, line 57 - page 11, line 2) and simultaneously, the receiving error

count is increased by 1 and the receiving antenna is switched (see Ohashi et al page 11, lines 39-47), so in this case the same data would be received by two different antennas as claimed.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohashi et al in view of Khayrallah (XP-000889044) and further in view of Suzuki (US 5787122).

Regarding claim 7, the combination of Ohashi et al and Khayrallah fails to expressly disclose a message spread across packet bursts.

In a similar field of endeavor, Suzuki discloses a system that receives an encoded signal dispersed into a plurality of symbols interleaved over a plurality of burst data (see column 8, line 62 - column 9, line 12), which reads on the claimed "each packet burst contains a portion of a space-time coded message spread across the first and second packet bursts".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Ohashi et al and Khayrallah with Suzuki to include the above signal dispersed into a plurality of symbols in order to use the advantages of burst signals such as the fact that transmission data are dispersed and thus can be transmitted from a plurality of antennas which improves the SIN of the reception signal as suggested by Suzuki (see column 8, lines 12-18 and figure 5).

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Kogiantis in view of Ohashi and Sampath et al (US 20030012308A1).

Regarding claim 19, Wang and Ohashi fails to disclose the notification of the number of antennas.

In a similar field of endeavor, Sampath et al discloses a system where a characteristic signal generator 450 generates a characteristic signal, based on one or more estimated system characteristics and/or deterministic system characteristics, such as number of transmit antennas, spatial configuration of the transmit antennas and transmit diversity mode (see page 4, paragraph 50).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Ohashi with Sampath et al to include the above notification in order to perform better channel estimation in a broad range of system environments which leads to advantages such as higher decoding error rates, lower information transmission rates and/or lower signal to noise ratios as suggested by Sampath et al (see page 1, paragraphs 10 and 11).

Regarding claim 20, Wang, Ohashi fails to expressly disclose the notification of supporting a protocol-assisted diversity operations. In a similar field of endeavor, Sam path et al discloses a system where some slots provide header information for the frame, such as whether spatial multiplexing or transmit diversity is enabled for the frame (see page 3, paragraph 40), which reads on the claimed "a receiver notifying a transmitter that said receiver accepts and responds to protocol-assisted diversity operations".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Suzuki with Sampath et al to include the above notification in order to perform better channel estimation in a broad range of system environments which leads to advantages such as higher decoding error rates, lower information

transmission rates and/or lower signal to noise ratios as suggested by Sampath et al (see page 1, paragraphs 10 and 11).

### *Response to Arguments*

6. Applicant's arguments with respect to claims 1-13, 15-21 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAWAR IQBAL whose telephone number is (571)272-7909. The examiner can normally be reached on 9 am to 6.30 pm Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, GEORGE ENG can be reached on 571-272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

/K. I./
Examiner, Art Unit 2617